STRUCTURAL REPORT

THE NAKAKI BASHAW GROUP, INC.
STRUCTURAL ENGINEERS

Long Beach City Hall East
Structural Review
October 15, 2003

SCOPE of OUR WORK

We participated in a meeting and job walk on June 9, 2003. At the meeting, and through subsequent conversations with the design team, we were asked to review the information provided to us (see below) and render an opinion as to any structural work that would be required to achieve the owners stated goals. Specific structural analyses were not performed at this stage.

At this time, we have been requested to render an opinion as to the work required to meet three different objectives:

- Baseline Approach
- Recommended Approach
- Long Term Investment Approach

Structural work required to meet each of these objectives is described below.

100 SOUTH LONG BEACH BOULEVARD

100 South Long Beach Boulevard is a ten story building, located in Long Beach, California. Typical story heights are 13'-4", with a taller first floor height. The building contains a partial basement that is primarily used to house mechanical equipment, and a partial mechanical penthouse on the roof.

INFORMATION PROVIDED

Original Architectural Plans: Architectural drawings prepared by Kenneth S. Wing, FAIA dated December 18, 1959 were provided for our review. Sheets included were A-1 through A-53.

Original Structural Plans: Structural drawings prepared by Bole and Wilson, Structural Engineers, dated December 18, 1959 were provided for our review. Sheets included were S-1 through S-25.

Structural Drawings for Seismic Upgrade: We were provided with just two sheets (S-9 and S-10) from the seismic upgrade designed by Albert C. Martin and Associates in 1990/1991. We were also provided with shop drawings, sheets E1-E7, 1-8 and 12-31. Rebar shop drawing sheets #1 & #2 were also included.

Soils Report: No soils report was available for our review. Soil bearing values were provided on sheet S-1, but there was no indication of the code used for design, nor information about the lateral loads used in design.

17101 Armstrong Avenue, Suite 208
Irvine, California 92614

949.794.0050
Fax 949.794.0055

Due Diligence Evaluation Report: By Ming Yang Yeh & Associates, Inc., dated June 17, 1999.

Due Diligence Evaluation Report: By The JCM Group, dated March 13, 2000.

Site Visit: The project site was visited on the morning of June 9, 2003 to observe the condition of the structure. In most areas, the structure was concealed by existing finishes. No attempt was made to visually observe concealed structure. No physical testing was conducted during this visit.

EXISTING STRUCTURAL SYSTEM

Vertical Load Carrying System: Vertical loads are carried by concrete over metal deck floors, 4" thick total, supported by steel beams spaced at 6'-0" o.c. typically. These beams are supported by steel girders and columns. Spread footings transfer the load to the supporting soil.

Lateral Load Carrying System: In the original design, lateral loads were resisted by sway frames on the long east and west sides of the buildings. In the transverse direction, sway frames were placed throughout the building at 18'-0" o.c. These frames consist of built up truss girders (riveted) spanning between wide flange columns. In addition, a cast-in-place concrete wall was placed on the north wall of the building.

In 1990 a seismic strengthening program was undertaken. While complete design documents of this rehabilitation program are not available, it seems to have consisted of the addition of a concrete shear wall on the south end of the building, along with some strengthening of the sway frames. The connections of the sway frames were welded at this time.

RECOMMENDATIONS

BASELINE APPROACH

The objective of the baseline approach is to define the minimum work required to occupy the building as an office building.

For this approach, the building use will not change. Therefore, there is no legal requirement to perform any structural rehabilitation to be able to occupy the building as long as the renovation is in conformance with 2001 CBC Section 3403.2 (i.e. does not create an unsafe condition.)

RECOMMENDED APPROACH

The objective of the recommended approach is to define the work required to bring this building up to a 'Class B' environment.

within the built up girders.

If either concrete shear walls or steel braced frames are added to the building, it is likely that foundation strengthening would be required as well.

MECHANICAL / PLUMBING / FIRE SPRINKLER REPORT

TKSC
Tsuchiyama Kaino Sun & Carter
Consulting Mechanical Engineers

MECHANICAL SYSTEM EVALUATION

LONG BEACH CITY HALL EAST

LONG BEACH, CALIFORNIA

August 20, 2003

Prepared by:

Kenneth K. Kaino

TSUCHIYAMA KAINO SUN & CARTER
17911 Von Karman Avenue, Suite 250
Irvine, California

INTRODUCTION

Tsuchiyama Kaino Sun & Carter has been requested to assess the mechanical systems (heating, ventilating and air conditioning [HVAC]; plumbing and fire protection infrastructure) for future use of the ten-story Long Beach City Hall East Building at 100 South Long Beach Boulevard, Long Beach, California.

The system evaluations are to take into consideration the following criteria:

A. Operating conditions of systems and suitability for continued use.

B. Current Uniform Building, Mechanical and Plumbing Code requirements, (UBC, UMC, and UPC).

C. ADA Accessibility Guidelines.

D. California Health and Safety Code.

E. California Administrative Code, Title 24, Energy Conservation Standards.

The future occupancy alternatives for consideration include the following:

A. Baseline Approach:
Minimum work required to occupy the building.

B. Recommended Approach:
Work required to bring building up to a 'Class B' environment.

C. Long Term Investment Approach:
Recommendations to rejuvenate the building for a new generation of occupancy and to bring the building up to a 'Class A' environment.

BASIS OF REVIEW

The following sources were used to compile the information for this study:

A. Field observations at the facility on Monday, June 9, 2003, conducted by Ken Kaino.

B. Due Diligence Evaluation Report prepared for Los Angeles County Department of Public Works by Ming Yang Yeh & Associates, Inc., dated June 17, 1999. Mechanical and Plumbing portion of the report was prepared by Mike Salazar & Associates. Fire Protection & Life Safety portion prepared by Gage-Babcock & Associates.

C. Due Diligence Evaluation Report Assessment and Overview Building Assessment prepared for the City of Long Beach, Department of Community Development by JCM Group, dated March 13, 2000. P2S Engineers provided comment on the HVAC, plumbing, electrical, fire prevention and life safety systems. Additionally, City of Long Beach staff from Community Development, the Police Department, Planning and Building Departments and Fire Prevention contributed to the study.

HVAC SYSTEM DESCRIPTION

The existing HVAC system consists of a chilled water and heating hot water central plant which supports two constant volume, dual duct, air handling units located in the basement of the building and two central station multi-zone units located in the first floor mezzanine. The central plant consists of built-up chillers (with reciprocating heat pump compressors), primary chilled water pumps and evaporative condensers located in the basement chiller room. The heat pump compressors reject heat to two shell and tube condensers that provide heating hot water. Heating hot water pumps pump the hot water to the air handling units and multi-zone units.

The system is approximately forty-three (43) years old. All equipment is beyond its useful service life as indicated in the table on page 8, American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Table 3, Estimates of Service Lives of Various System Components. The table is a guideline; however, most equipment can provide valuable service beyond the listed service life.

An exhaust fan located on the roof draws exhaust air from restrooms and other required areas. Outside air is provided to the four air handlers from different locations at the lower levels.

The building control system is pneumatic. Maintenance personnel manually start and stop equipment. Temperature controls (zones and air handling functions) are pneumatic. There is a duplex control air compressor system.

PLUMBING SYSTEM DESCRIPTION

The existing plumbing systems consist of a sanitary sewer system and domestic hot and cold water systems. There is no natural gas service to the building. Individual system descriptions are as follows:

A. The building sewer system, for floors 1 through 10 and the penthouse, drains by gravity to a building sewer main that connects to a City of Long Beach manhole on the north side of the building. All fixtures and drains at the basement level drain by gravity to a duplex sewage ejector that discharge to the gravity main.

B. The building domestic water is supplied from a city water main on the north side of the building. The street pressure serves floors 1 through 5. Pressure is boosted to serve floors 6 through 10 by means of a duplex house pump system located in basement.

C. The building domestic hot water system is a series of 40-gallon electric water heaters located throughout the building.

FIRE PROTECTION SYSTEM DESCRIPTION

The building is provided with dry standpipe systems located in each of two stairwells. Provided primarily for firefighter use, there are 2½" hose connections at each floor. The fire department connections for the dry standpipe are located on the First Street side of the building. There are 1½" fire hose racks and fire extinguishers in the Basement level, subterranean parking garage, north wing of the 10th floor and in each corridor wing of each floor above floor 1. Fire sprinklers are only provided for the basement mechanical areas and the subterranean parking garage.

RECOMMENDATIONS

I. BASELINE APPROACH:

Minimum work required to occupy the building.

A. HVAC:

1. Run/test equipment and repair malfunctioning equipment.

2. Inspect building and identify fire-rated walls and ceilings. Provide appropriate protection for HVAC openings in rated walls and ceilings.

3. Test all air handling surfaces (e.g. duct interiors, air handler interior panels, coils, drain pans, filters, etc.) for hazardous materials (e.g. mold, mildew, etc.). Clean ductwork and air handling unit interior surfaces as required.

4. Provide smoke control system.

B. PLUMBING:

1. Enlist the services of a Corrosion Consultant and test sample piping of all plumbing systems in the building. Repair piping in disrepair.

2. Upgrade non-complying fixtures to ADA requirements (e.g. urinals, drinking fountains, etc.).

3. Run/test plumbing equipment (booster pumps, sump pumps, water heaters) and repair malfunctioning equipment.

4. Provide trap primers for floor drains.

C. FIRE PROTECTION:

1. Provide full building fire sprinkler system.

II. RECOMMENDED APPROACH

Work required to bring building up to a 'Class B' environment

A. HVAC:

1. Run/test equipment and replace malfunctioning equipment.

2. Inspect building and identify fire-rated walls and ceilings. Provide appropriate protection for HVAC openings in rated walls and ceilings.

3. Test all air handling surfaces (e.g. duct interiors, air handler interior panels, coils, drain pans, filters, etc.) for hazardous materials (e.g. mold, mildew, etc.). Clean ductwork and air handling unit interior surfaces as required.

4. Provide smoke control system.

B. PLUMBING:

1. Enlist the services of a Corrosion Consultant and test sample piping of all plumbing systems in the building. Repair piping in disrepair.

2. Replace all galvanized iron water pipe with copper.

3. Upgrade non-complying fixtures to ADA requirements (e.g. urinals, drinking fountains, etc.).

4. Run/test plumbing equipment (booster pumps, sump pumps, water heaters) and replace malfunctioning equipment.

5. Provide trap primers for floor drains.

C. FIRE PROTECTION:

1. Provide full building fire sprinkler system.

III. LONG TERM INVESTMENT APPROACH:

Recommendations to rejuvenate the building for a new generation of occupancy and to bring the building up to a 'Class A' environment.

A. HVAC:

1. Replace all HVAC central plant equipment with contemporary, high efficiency equipment and systems (e.g. high efficiency chillers with non-CFC refrigerant, variable volume air handlers, etc.). Provide natural gas fired heating hot water boiler.

2. Inspect building and identify fire-rated walls and ceilings. Provide appropriate protection for HVAC openings in rated walls and ceilings.

3. Test all existing interior duct surfaces for hazardous materials (e.g. mold, mildew, etc.). Clean ductwork as required.

4. Provide smoke control system.

5. Provide new condenser water system for tenant computer room air conditioners (e.g. roof-mounted closed circuit coolers, pumps and pipe risers).

6. Provide new secondary air distribution systems with electronic VAV boxes, ceiling diffusers and return air registers. Approximate zone density of 1,000 sq.ft. per zone.

7. Provide new microprocessor-based direct digital controls to control air conditioning systems (DDC). Remove pneumatic controls.

B. PLUMBING:

1. Enlist the services of a Corrosion Consultant and test sample piping of all plumbing systems in the building. Replace piping systems in disrepair.

2. Replace all galvanized iron water pipe with copper.

3. Upgrade non-complying fixtures to ADA requirements (e.g. urinals, drinking fountains, etc.).

4. Replace existing house pump system with package triplex booster pumps and hydropneumatic tank, factory assembled on a common steel base to meet system requirements. The existing house pump system is original equipment that is beyond the end of its anticipated service life. The new system would maintain a constant uniform water pressure regardless of fluctuations in suction pressure. The new system would provide greater energy efficiency particularly at extended time periods of low or no demand. The new system would be installed at the same location as the existing with new piping and valves connecting to existing piping. Electrical service to the house pump system will need to be addressed in this scope of work.

5. Replace existing duplex sewage ejector pumps and controls with new, of like capacity, at basement. The existing sewage ejector pumps are beyond the end of its anticipated service life. Electrical service to ejectors will need to be addressed in this scope of work.

6. At core area restrooms, remove all existing plumbing fixtures and provide new rough-in's and water conservation fixtures based on architectural layout for ADA accessibility. Existing fixtures likely do not meet current water conservation standards, and are not ADA compliant. It is recommended that core piping be removed to main stacks and risers with new piping reconnected at that point. New water closets and urinals should be wall-hung with exposed sensor-operated flush valves. Lavatories should be wall-hung with self-closing or sensor-operated faucets.

7. Replace distributed electric water heaters with centralized natural gas fired domestic hot water system.

8. Provide trap primers for floor drains.

C. FIRE PROTECTION:

1. Provide full building fire sprinkler system.

IV. ASHRAE EQUIPMENT SERVICE LIFE TABLE:

Table 3 Estimates of Service Lives of Various System Components[a]

Equipment Item	Median Years	Equipment Item	Median Years	Equipment Item	Median Years
Air conditioners		Air terminals		Air-cooled condensers	20
Window unit	10	Diffusers, grilles, and registers	27	Evaporative condensers	20
Residential single or split package	15	Induction and fan-coil units	20	Insulation	
Commercial through-the-wall	15	VAV and double-duct boxes	20	Molded	20
Water-cooled package	15	Air washers	17	Blanket	24
Heat pumps		Ductwork	30	Pumps	
Residential air-to-air	15[b]	Dampers	20	Base-mounted	20
Commercial air-to-air	15	Fans		Pipe-mounted	10
Commercial water-to-air	19	Centrifugal	25	Sump and well	10
Roof-top air conditioners		Axial	20	Condensate	15
Single-zone	15	Propeller	15	Reciprocating engines	20
Multizone	15	Ventilating roof-mounted	20	Steam turbines	30
Boilers, hot water (steam)		Coils		Electric motors	18
Steel water-tube	24 (30)	DX, water, or steam	20	Motor starters	17
Steel fire-tube	25 (25)	Electric	15	Electric transformers	30
Cast iron	35 (30)	Heat Exchangers		Controls	
Electric	15	Shell-and-tube	24	Pneumatic	20
Burners	21	Reciprocating compressors	20	Electric	16
Furnaces		Package chillers		Electronic	15
Gas- or oil-fired	18	Reciprocating	20	Valve actuators	
Unit heaters		Centrifugal	23	Hydraulic	15
Gas or electric	13	Absorption	23	Pneumatic	20
Hot water or steam	20	Cooling towers		Self-contained	10
Radiant heaters		Galvanized metal	20		
Electric	10	Wood	20		
Hot water or steam	25	Ceramic	34		

Source: Data obtained from a survey of the United States by ASHRAE Technical Committee TC 1.8 (Akalin 1978).
[a]See Lovvorn and Hiller (1985) and Easton Consultants (1986) for further information.
[b]Data updated by TC 1.8 in 1986.

ELECTRICAL REPORT

Long Beach City Hall - East
Electrical Due Diligence Inspection / Recommendations

October 15, 2003

We performed a visual due diligence inspection of the Long Beach City Hall Building – East located at 100 Long Beach Boulevard in Long Beach, CA on June 9, 2003. This visual inspection was limited to a brief visual overview with the building engineer, with the intention to familiarize ourselves with the building electrical infrastructure especially as it relates to the previously prepared due diligence reports.

We also reviewed the information / recommendations indicated in the following provided documentation, as prepared by others:

1. Due Diligence Report, dated June 17th, 1999 as prepared by Ming Yang Yeh & Associates.

2. Due Diligence Report, dated March 13th, 2000 as prepared by JCM Facilities Planning and Management.

3. The original building construction documents date 12/18/59.

4. A fourth floor tenant improvement package dated 6/4/2001.

This report summarizes our recommendations in regards to the electrical infrastructure in the following categories:

1. Baseline Approach Items – the minimum work required to occupy the building.

2. Recommended Approach Items – the minimum work required to bring this building up to a Class "B" environment.

3. Long Term Investment Approach Items – All recommendations to bring this building up to a Class "A" environment.

Baseline Approach Items:

1. The main service disconnect 5000 amp breaker has apparently been modified and / or actually deleted. This disconnect device is required by code and should be re-installed with a device that provides Ground Fault Protection per code requirements.

2. It appears that the building's life safety / emergency generator has been removed – apparently by the previous owner before they turned over the building. It appears that most of the distribution equipment was left in place although a detailed investigation of what work is required to bring the system up-to-date should be performed.

3. There are a variety of "minor" recommendations in Section 1.3 of the Due Diligence Report, dated June 17th, 1999 as prepared by Ming Yang Yeh & Associates that should be implemented immediately. The items are summarized as follows:

a. Replace all of the "B" panels on the 2nd, 3rd, and the 5th through 10th floors with new 42-circuit panels.

b. Measure the loads on transformers T-1, T-2, and T-3 to insure that they are not overloaded.

c. Measure the loads on the circuits feeding the following panels to insure that they are not overloaded: DP-7, DP-4, 6B, 3B, and 2B.

d. Rename the new panels 2C and 10C as 2D and 10D to eliminate confusion with other panels with the same name.

e. Relocate the new panel 2D (was 2C) in the 2nd floor electrical room to comply with the provisions of NEC 110-16.

4. Depending on the power density of the proposed / future tenant improvements, an upgrade to the existing 120 / 208 volt distribution system may need to be performed on a floor-by-floor basis. Please see a description of these recommendations in the Recommended Approach Items list.

5. Depending on the interpretation of the local fire authority, an upgrade of the existing fire alarm system may need to be performed on a floor-by-floor basis. Please see a description of these recommendations in the Recommended Approach Items list.

Recommended Approach Items:

1. The existing 120 / 208 volt distribution system should be upgraded on each of the floors to provide an increased power density that can facilitate a modern office tenant improvement. The current 120 / 208 volt distribution system provides for approximately 4.0 watts per square foot of power density. We typically provide for at least 6.0 watts per square foot of power density - although we have seen tenant requirements for up to 10.0 watts per square foot. The main electrical infrastructure in the building is capable of providing power to the new transformers. We would recommend at least a 112.5-kVA transformer on each floor.

2. The existing fire alarm system does not meet current code standards and should be replaced with a new code compliant system. Typically existing, functioning high-rise fire alarm systems are not required to be upgraded, if the building's remodeled use remains the same. It is unlikely that the local building officials will actually require this upgrade – therefore we are indicating this item as a recommended approach item. Please see the description of shortcomings in the Due Diligence Report, dated June 17th, 1999 as prepared by Ming Yang Yeh & Associates.

Long Term Investment Approach Items:

1. The parking garage lighting system should be updated with a modern T8 / T5 fluorescent system. Typical paybacks for these improvements are in the 1-2 year range.

2. The entire building interior lighting system should be updated with a modern T8 / T5 fluorescent system. Typical paybacks for these improvements are in the 1-2 year range.

3. The entire building should be provided with a modern low voltage lighting control / motion sensor system. Typical paybacks for these improvements are in the 6-9 month range.

4. The entire exterior building architectural lighting system should be replaced / renovated to provide an architecturally desirable appearance.

*****END*****